

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL SEARCH REPORT**

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 017750-781	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US02/37008	International filing date (day/month/year) 19 NOVEMBER 2002	(Earliest) Priority Date (day/month/year) 20 NOVEMBER 2001
Applicant LOCKHEED MARTIN CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2.  **Certain claims were found unsearchable** (See Box I).

3.  **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

The Title is too long. See PCT Rule 4.3. New Title: INFRARED IMAGING WITH SINGLE ASPHERIC-HOLOGRAPHIC LENS

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 88.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

as suggested by the applicant.

because the applicant failed to suggest a figure.

because this figure better characterizes the invention.

None of the figures.

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US02/37008

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: 5 and 8  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  

The application, as originally filed, did not describe: red MWIR, blue MWIR, and indigo LWIR, and thus a meaningful search could not be carried out since it is unclear what is a red MWIR, blue MWIR, and indigo LWIR.
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

The additional search fees were accompanied by the applicant's protest.



No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US02/37008

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

A compact wide field of view, infrared imaging system (100) for detecting two Mid-Wave Infrared "MWIR" and, optionally, an additional one Long-Wave Infrared "LWIR" band, has a single, color corrected lens element (133) and a detector (124) within a dewar assembly (106). The lens element (122) has two aspherical surface profiles and utilizes a holographic optical element to manipulate bands of energy that are harmonic components of each other. An exemplary infrared imaging apparatus performs at an F-stop "F#" of at least 1.4 with a square field of view of 90x90 degrees.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/37008

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G01J 5/08

US CL :250/352

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 250/352

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO APS EAST

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,507,551 A (HOWARD et al) 26 March 1985 (26.03.1986), figure; column 2, line 9 - column 3, line 30.	1-4,6,7,9-30
Y	US 5,369,511 A (AMOS) 29 November 1994 (29.11.1994), column 18, line 43 - column 19, line 9.	3,4,9,17,20
Y	US 6,034,407 A (TENNANT et al) 07 March 2000 (07.03.2000), column 2, lines 13-36.	6,7,14
Y	US 2001/0029816 A1 (BEN-MENACHEM et al) 18 October 2001 (18.10.2001), paragraphs 0002, 0003, 0075.	1-4,6,7,9-20

Further documents are listed in the continuation of Box C.

See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
08 JANUARY 2003	04 APR 2003
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer SHUN LEE Telephone No. (703) 308-0956